## Chapter 4. Part 3. Burns and Scalds

# Chapter 4 • Management of Common Injuries

### Part 3 • Burns and Scalds

*(How to recognise the type and depth of a burn—and what to do in the first 10 minutes)*

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### 1 What Are Burns and Scalds?

- **Burn** = tissue damage caused by **dry heat** (flame, hot metal, electricity, chemicals, radiation).
- **Scald** = burn caused by **moist heat** (boiling water, steam, hot oil, soup).
  Both destroy skin cells and, if deep, the tissues underneath (fat, muscle, even bone).

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## 2 Classification by Depth (How Many Skin Layers Are Injured?)

| Old Term | Modern Term | Skin Layers Involved | Key Visual Signs | Pain Level | Healing Time* |
|---|---|---|---|---|---|
| **1st-degree** | **Superficial burn** | Only epidermis | Red, dry, no blisters (like sunburn) | Painful | 3–7 days, no scar |
| **2nd-degree** | **Superficial partial-thickness** | Epidermis + top dermis | Red-pink, **clear blisters**, moist, capillary refill brisk | Very painful | 1–3 weeks, minimal scar |
| | **Deep partial-thickness** | Epidermis + deep dermis | Blotchy red-white, sluggish cap refill, less moist | Sensation ↓ | 3–6 weeks, often scars |
| **3rd-degree** | **Full-thickness** | All skin layers, may expose fat | Waxy white, brown or charred; **painless** (nerves burned) | No pain in centre | Needs grafting |
| **4th-degree** | **Sub-dermal** | Skin + fat + muscle / bone | Charred, black, bone visible | No pain in centre | Surgical / amputation |

*Assuming good first aid and no infection.

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### 3 Classification by Size (Total Body Surface Area = TBSA)

Use the **Rule of Nines** for adults:

- Head = 9 % • Each arm = 9 % • Each leg = 18 % • Torso front = 18 % • Back = 18 % • Perineum = 1 %

**Severity Guide (Adults)**

| Burn Depth | TBSA % | Classified As | Action |
|---|---|---|---|
| Any superficial | <10 % | **Minor** | Out-patient care |
| Partial-thickness | 10–20 % | **Moderate** | Hospital observation |
| Full-thickness | >1 % OR any on face, hands, feet, genitalia, joints | **Major** | Burn centre / ICU |

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### 4 First-Aid Principles—The "C O O L" Rule

**C**ool • **O**bserve • **O**ver (cover) • **L**oop in help

1. **Cool the burn** with **running cool tap water** (NOT ice, NOT icy water) for **20 minutes**. Works up to 3 h after injury.
2. **Observe** for jewellery, tight clothing—remove gently before swelling starts.
3. **Cover** the area with a **clean non-fluffy dressing**: cling film, sterile gauze, or a clean plastic bag (for hand/foot).
4. **Loop in help**: call EMS if burn is deep, >10 % TBSA, electrical, chemical, on critical areas, or if the casualty is a child/ elderly.

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## 5 Special First Aid by Cause

### 5.1 Thermal Burns (Flame, Hot Objects, Scalds)

1. **Stop the heat source**—turn off gas, smother flames with blanket.
2. Follow **C O O L**.
3. **Do NOT**: apply butter, toothpaste, turmeric, or ice; break blisters.

### 5.2 Chemical Burns (Acids, Alkalis, Industrial Cleaners)

1. **Protect yourself**—wear gloves, goggles.
2. **Brush off dry powder** chemicals first (lime, cement).
3. **Irrigate immediately** with **copious running water** for **30 minutes** or until EMS says stop. Remove contaminated clothing while flushing.
4. **Cover loosely** with sterile dressing.
5. **Do NOT** neutralise with the opposite chemical (acid vs base)—can cause heat reaction.

### 5.3 Electrical Burns (Household, Power Lines, Lightning)

1. **Switch off power** or push casualty away with non-conductive stick.
2. **Check ABCs**—cardiac arrest common; start CPR if no pulse.
3. Look for **entry and exit wounds** (small skin burns) but **assume deep tissue damage**.
4. Treat any visible burns as thermal (C O O L) but **always send to hospital** (risk of heart rhythm trouble, kidney injury).
5. If lightning strike: Treat as electrical; multiple casualties—first treat those who **appear dead** (they may be in reversible cardiac arrest).

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## 6 Immobilisation & Transport

| Situation | Simple Immobilisation Trick |
|---|---|
| Burn on limb with severe pain/swelling | Elevate on pillow; loosely wrap with cling film from distal → proximal to limit oedema. |
| Facial burn with airway risk | Sit upright if conscious; watch for hoarse voice / stridor—prepare for rapid EMS arrival. |
| Circumferential limb burn | Remove rings/watches; mark pulses; splint gently to reduce movement pain. |

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## 7 Red-Flag Signs—Call EMS or Go to Burn Centre

- Burned area **larger than the patient's palm × 3**.
- **Full-thickness** or **deep partial-thickness** burn anywhere.
- Any burn on **face, hands, feet, groin, major joint**.
- Chemical or electrical source.
- Signs of inhalation injury (soot in mouth, coughing black, singed nasal hair, hoarse voice).
- Child <5 y or adult >60 y with >5 % TBSA burn.
- Casualty with diabetes, heart disease, or immune compromise.

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## 8 Self-Check Quiz

1. **Why is ice a bad idea on a fresh burn?**
2. **How long should you flush an alkali chemical burn to the eye?**
3. **Which two hidden complications worry us most after an electrical burn?**
4. **What depth of burn is painless in the centre and why?**
5. **Rule of Nines**: What percent is the front of one leg?

1. Causes vasoconstriction → worsens tissue death; may create frost injury.
2. Minimum 20–30 min with cool water or sterile saline.
3. Cardiac arrhythmia and muscle-breakdown kidney damage (rhabdomyolysis).
4. Full-thickness burn; nerves destroyed.
5. 9 % (each leg front = half of 18 %).

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### Key Take-Home Points

- **Depth + Size = Severity.** Learn the table.
- **C O O L** water is your first medicine—20 min for thermal, 30 min+ for chemical.
- **Never add exotic substances**; clean, cover, and refer.
- **Electrical burns look small outside but cook deep inside—always hospital.**
- Protect yourself first; a burned first aider helps no one.

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**Next skills lab:** Practise building a burn dressing using cling film and learn to pour "continuous cool water" on a mannequin limb while keeping the rest of the body warm with blankets.





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